

Work Order ID 132263

Tuesday, May 05, 2015 10:03:15 AM

132263

Page 1

Item ID: D407-667-205 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Aft Crosstube - High 407
 Start Date: 5/5/2015 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 5/5/2015 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: MCS Date: MAY 05 2015 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D407-667-245	G								
100	Document Control	0.00							DAS
100	DOCUMENT CONTROL								02
DC	Memo	0.00							9-89
Doc.Control -USB or Paperwork	Photocopy bluefile and create labels as per PPP D407-667-205 CHG009								AUG 04 2015
110	Pick Kit	0.00							
110	Packaging								
Packaging	Memo	0.00							
Packaging									
120		0.00							
120	BENDING MACHINE - CROSSTUBES								
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21								

BL 15/07/2013

JW 15-07-13

Tuesday, May 05, 2015 10:03:15 AM

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Accept

Setup Start *NS1*

Stop *NS2*

Cust Item ID:

Customer:

Required Date: 5/5/2015 **Req'd Qty:** 1.00 ***1***

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Operation Description

Set Up/ Run Hours

Tool ID	Tool #	Plan Code
---------	--------	-----------

Accept Qty	Reject Qty	Reject Number	Insp. Stamp

130

QC15- Crosstube Dimensional Check

0.00

1.30

QC

Memo

0.00

Quality Control

38
9-89

15-03-13

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Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Aft Crosstube - High 407

Start Date: 5/5/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run

Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

140

Crosstubes

Crosstubes

0.00

0.00

Memo

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: BC *****

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes. Holes facing inboard. Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: BC *****2- Drill fwd rivet holes using drill Jig DT8787 fwd as per Dwg D407-667-245.
Note: FWD side has 3X top holes facing inboard.

3- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom hole to prevent accidental drilling. Drill holes and ream using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes. Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: BC *****

5-Drill aft rivet holes using drill Jig DT8787 aft as per Dwg D407-667-245.



15-07-15

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Item ID: D407-667-205 Accept ***N900040100*** Setup Start ***NS1***
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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Drill only the top (2) holes.

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
 VERIFIED BY: mmk *****

6- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

7- Scribe tube to identify on the inner chamfer in the cuff D# and B#

8-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***Debur
 & Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245

BC 15/07/16

150

QC5- Inspect part completeness to step on W/O 0.00

150

QC

Quality Control

Memo 0.00

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

16

DAS
49
9-89

15/07/16

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Item ID: D407-667-205

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N900040100

Setup Start

NS1

Revision ID:

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Stop

NS2

Start Date: 5/5/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

160

0.00

160

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

1- CLEAN CROSSTUBE WITH WASH'N WIPE

DAS

41

9-89

15-7-15

180

Outsource process - NDT per QSI038 4.1

0.00

180

Outsource2

Memo

0.00

Outsource process - NDT

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Liquid Penetrant Inspection as per QSI 0380

Issue P/O: 29199 LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

6 15-07-21

190

0.00

190

Packaging

Packaging

Memo

0.00

Packaging

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Ensure copy of NDT results attached to work order.

1X 8015-07-21

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N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube - High 407

Stop ***NS2***

Start Date: 5/5/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start ***NR1***

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop ***NR2***

Sequence ID/

Work Center ID

Operation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

0.00

210

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE ***

DAS

41

9-89

15-7-23

1-Prime inside and outside crosstube as per DEO D407-667-245 and QSI 005 4.2

PRIME: 132384

Start Time: 1030

Finish Time: 1115

Mask underside of crosstube as shown

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PAINT: 132664

Start Time: 700

Finish Time: 745

3- Apply clear coat as per dwg

Clear Coat Batch: 131483

Picklist Print

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Work Order ID: 132263

132263

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube - High 407

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

Comments:
 IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM
 IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
 JLM

****CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER****

IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified
 by:EC

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I

10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev J 11.04.26

removed abrasion strip ecn 11-551 EC verified

by:DD

IPP REV:K

11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D407-667-205TRN

Manufactured No

110

Each

4.0000

1

1

D407-667-205TRN

Crosstube Turning Detail

**

BL 15/07/13

Location

Loc Qty

Loc Code

LG

4

129300

1

129301

1

129302

1

129303

1

Picklist Print

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Work Order ID: 132263

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Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube - High 407

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

D2873-043

Manufactured No

230

Each

72.0000

2

2

DAS
41
9-89

15-7-21

D2873-043

Nut Plate Assembly

Location

Loc Qty

Loc Code

LG

40

128814

40

2

LG052

32

127801

2

129732

10

130883

20

D2873-045

Manufactured No

230

Each

35.0000

2

2

DAS
41
9-89

15-7-21

D2873-045

Nut Plate Assembly

Location

Loc Qty

Loc Code

LG052

35

125286

2

127534

13

128896

10

131004

10

D2894-1

Manufactured No

230

Each

9.0000

1

1

DAS
41
9-89

15-7-27

D2894-1

2.75 Support

Location

Loc Qty

Loc Code

LG052

9

125251

9

D3190-1

Manufactured No

230

Each

7.0000

2

2

DAS
41
9-89

15-7-27

D3190-1

Chaffing Shield

Location

Loc Qty

Loc Code

LG053

7

129524

7

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Shop Packet Print

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Picklist Print

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Page 3

Work Order ID: 132263

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube - High 407

132263

D407-667-205

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

230

Each

112.0000

2

2

DAS

41

9-89

15-7-28

D3595-063-450

Rubber Cushion 0.63" wide x 4.50" Long

**

2

Location

Loc Qty

Loc Code

FG

22

129907

10

131013

6

88422

6

LG050

29

131013

29

LG051

61

115780

11

131875

50

MS20601-AD4W8

Purchased

No

230

Each

310.0000

14

14

DAS

41

9-89

15-7-21

MS20601-AD4W8

RIVET

**

15 -> 1 scrap

Location

Loc Qty

Loc Code

ST308

310

M128650

110

M132107

200

MS21920-22

Purchased

No

230

Each

74.0000

4

4

DAS

41

9-89

15-7-27

MS21920-22

Clamp

**

4

Location

Loc Qty

Loc Code

LG050

74

M128636

3

M130822

2

M132045

69

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Work Order ID: 132263

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube - High 407

132263

D407-667-205

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

230

Each

84.0000

2

2

DAS

MS21920-25

Clamp

41

9-89

15-7-27

2

Location

Loc Qty

Loc Code

FG

10

120920

10

LG050

70

M130400

10

M131367

3

M131856

17

M132169

40

Return2015

4

M131367

4

NAS1149D0563J

Purchased

No

230

Each

1,255.000

18

18

NAS1149D0563.J

Washer

68-6

27

DAS

DAS

02

9-89

Location

Loc Qty

Loc Code

GA

130

m125807

130

ST260a

949

m130799

63

m132035

886

ST269

156

m128257

156

ST271

20

m131026

20

m132286

18

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Work Order ID: 132263

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube - High 407

132263

D407-667-205

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

AN5-10A Purchased No 250 Each 251.0000 10 10

AN5-10A

BOLT

DAS
02
9-89

Location

Loc Qty

Loc Code

GA 51
122800 51
ST299A 50
132189 50
ST338 150
M131624 150

**

DAS
27
9-89

AN5-32A Purchased No 250 Each 223.0000 4 4

AN5-32A

Bolt

DAS
02
9-89

Location

Loc Qty

Loc Code

ST299A 207
m130716 7
m131139 100
m132189 100
ST336 16
m128403 7
m128634 9

**

DAS
27
9-89

AN5-34A Purchased No 250 Each 67.0000 4 4

AN5-34A

Bolt

DAS
02
9-89

Location

Loc Qty

Loc Code

ST336 67
m128634 67

**

DAS
27
9-89

m132551

JUL 29 2015

Picklist Print

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Work Order ID: 132263

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube - High 407

132263

D407-667-205

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

250

Each

537.0000

4

4

MS21042L5

Nut

DAS

27

9-89

DAS
02
9-89

Location

Loc Qty

Loc Code

GA

150

m127813

150

ST305

387

m127813

54

m130388

12

m131340

21

m132123

300

m132256

4

JUL 29 2015

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

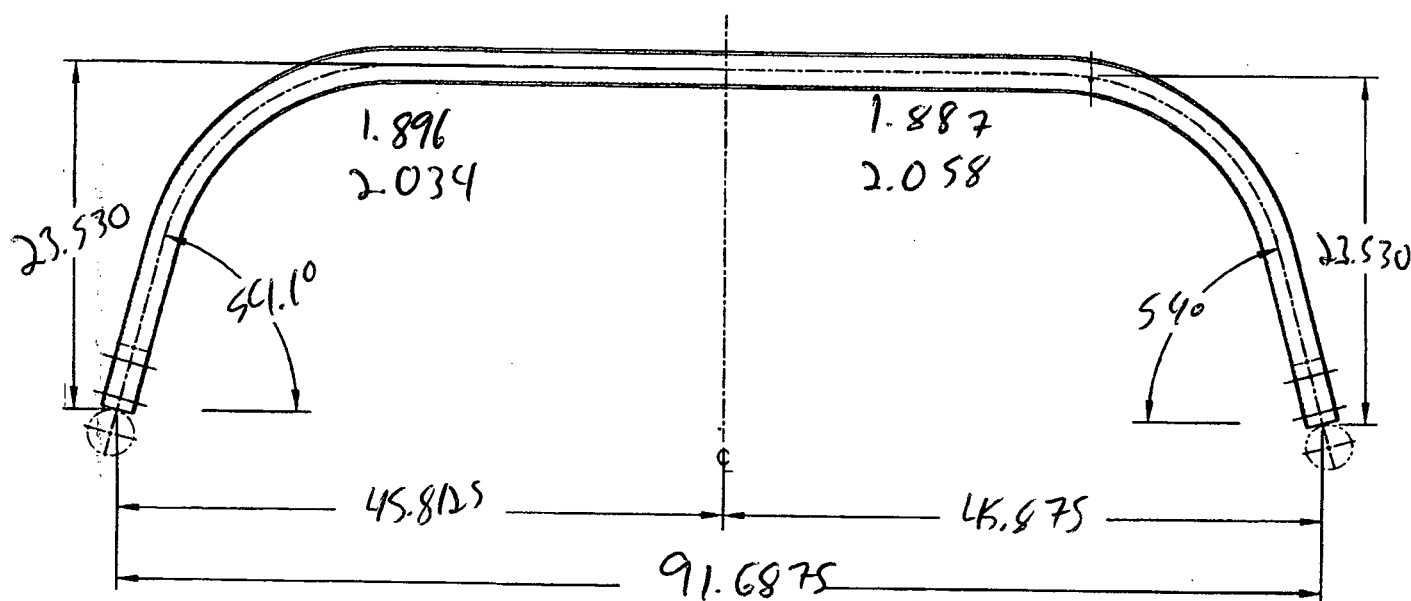
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																						
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐																						
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																						
Large Fab ☐	Composite ☐	Supplier ☐																							
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval																		
Description Work Order Deviation				Disposition			Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																		
Root Cause		FAULT CATEGORY																							
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐	OTHER : _____																			

DART AEROSPACE LTD		Work Order:	132263
Description: Crosstube High Aft (407)		Part Number:	D407-667-205
Inspection Dwg: D407-667-245	Rev: 6911	Page 1 of 1	

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	28	28
Crushing	3.5%	4.2%
Comments		

QC15 Inspection		DAS
Date		38
		75-07-13

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	
E	12.04.16	Added bending, crushing dimensions	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
1	1	D6011-115	CROSSTUBE
2	2	D2873-043	NUT PLATE
3	2	D2873-045	NUT PLATE
4	1	D2894-1	SUPPORT
5	2	D3190-1	CHAFING SHIELD
6	2	D3595-063-430	RUBBER CUSHION
7	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
8	4	MS21920-22	CLAMP
9	2	MS21920-25	CLAMP (OR MS21920-24)
10	AR	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
11	AR	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT CROSSTUBE PER DART QSI 005 4.2
FOR HATCHED AREAS (ZN A6-2), MASK AS REQUIRED
TO APPLY PRIME AND APPLY CLEAR COAT ONLY
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1 CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS 50 TO 70 DEGREES FROM BOTTOM OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. TORQUE CLAMPS ON D3190-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

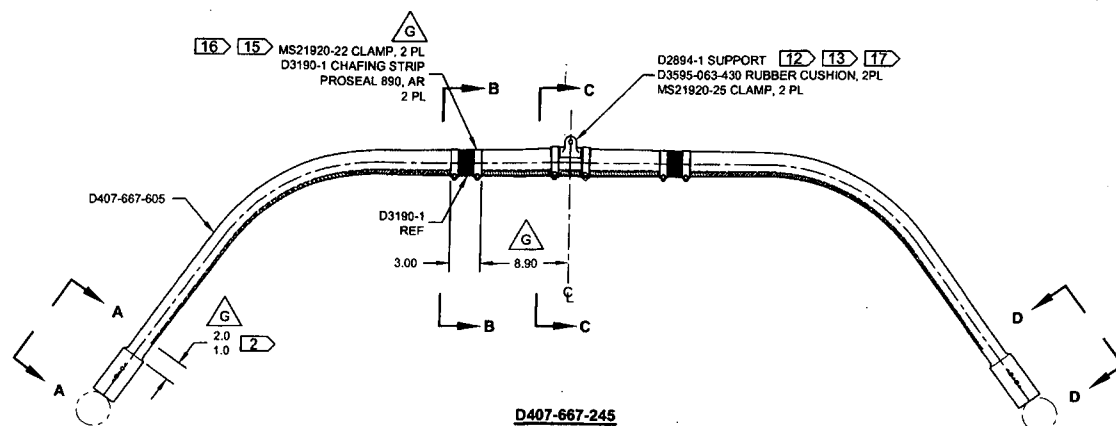
RELEASED

2015 APR 09

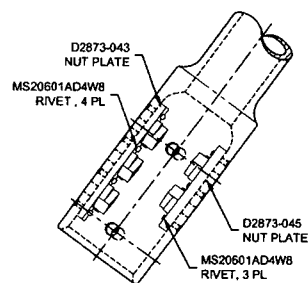
Q ECN 15-557

G	INCORP. DEO's D407-667-245-F1/F2 (ZN D8-1, A8-1, D5-2, B6-2, C6-2); 8.90 WAS 8.53 (ZN D5-2); TORQUE REDUCED FOR CHAFING SHIELD (ZN A8-1); FINISH REVISED TO ALLOW MANUFAC. FLEXIBILITY (ZN C8-1)	RF	15.03.20
F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C8-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1226	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.28
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	Q		
DRAWN	RF		
CHECKED	Q		
MFG. APPR.	Q		
APPROVED	Q		
DE APPR.	Q		
DATE	15.03.20		

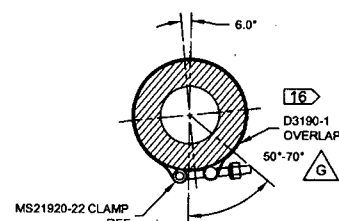
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D407-667-245	REV. G SHEET 1 OF 4
TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	SCALE NTS
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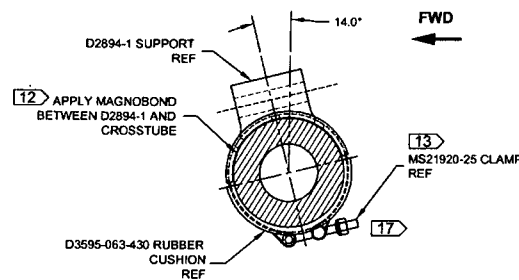
**D407-667-245
ASSEMBLY DETAIL
(VIEW LOOKING FWD)**



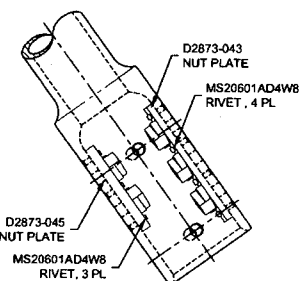
**VIEW A-A CUFF DETAIL
SCALE 4X**



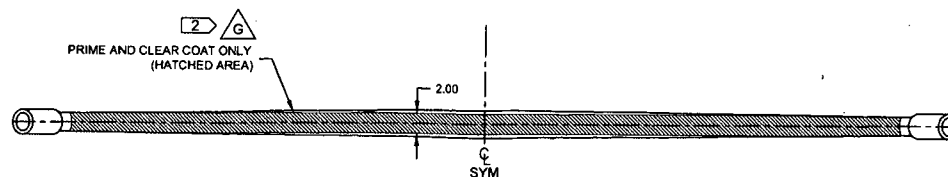
**SECTION B-B
SCALE 4X, 2PL**



**SECTION C-C
SCALE 4X**



**VIEW D-D CUFF DETAIL
SCALE 4X**



RELEASED
2015 APR 08

DESIGN	<i>P</i>	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>P</i>	DRAWING NO.	REV. G
MFG. APPR.	<i>RF</i>	D407-667-245	SHEET 2 OF 4
APPROVED	<i>RF</i>	TITLE	SCALE
DE APPR.	<i>RF</i>	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	15.03.20	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
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8

7

6

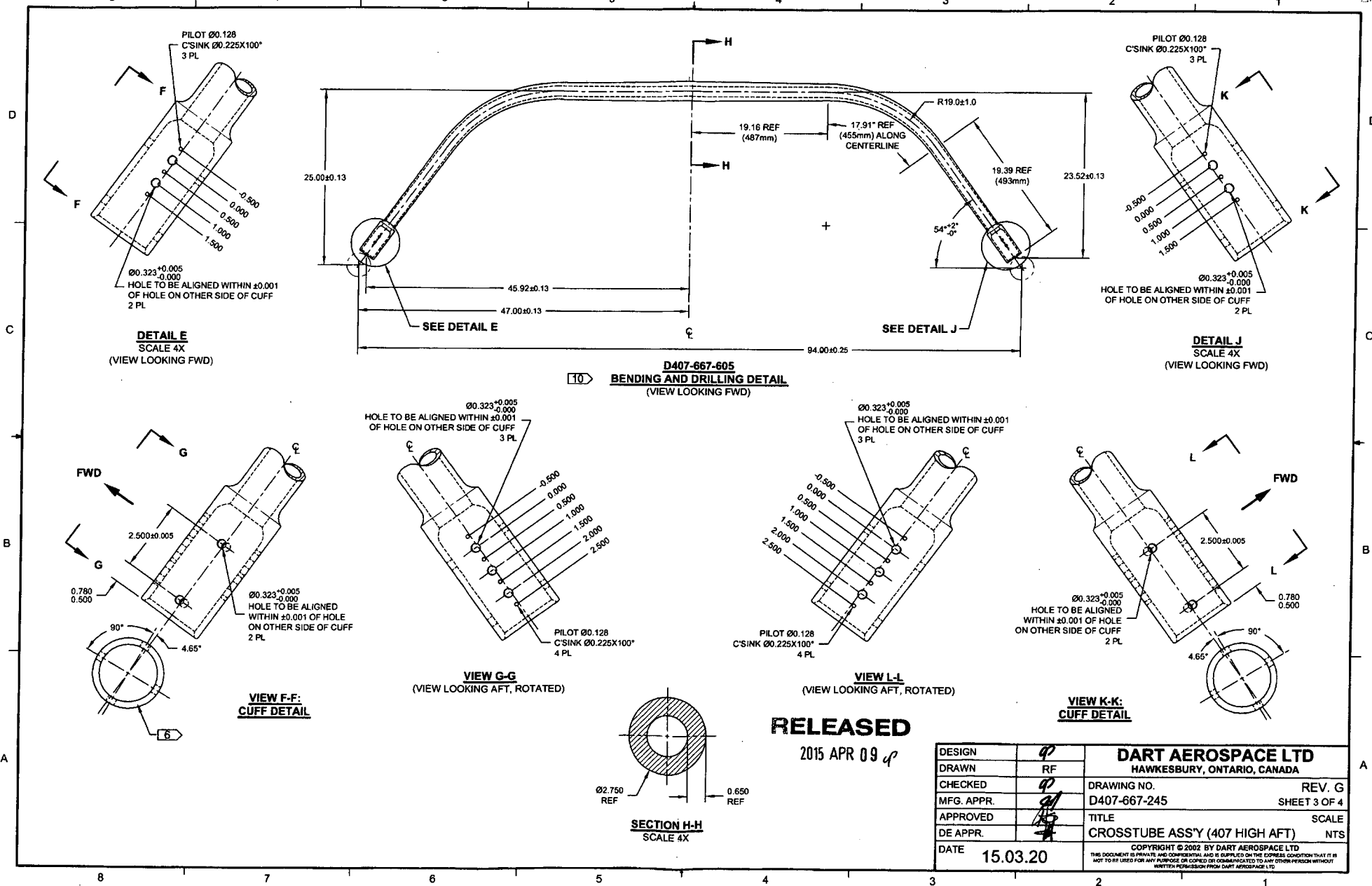
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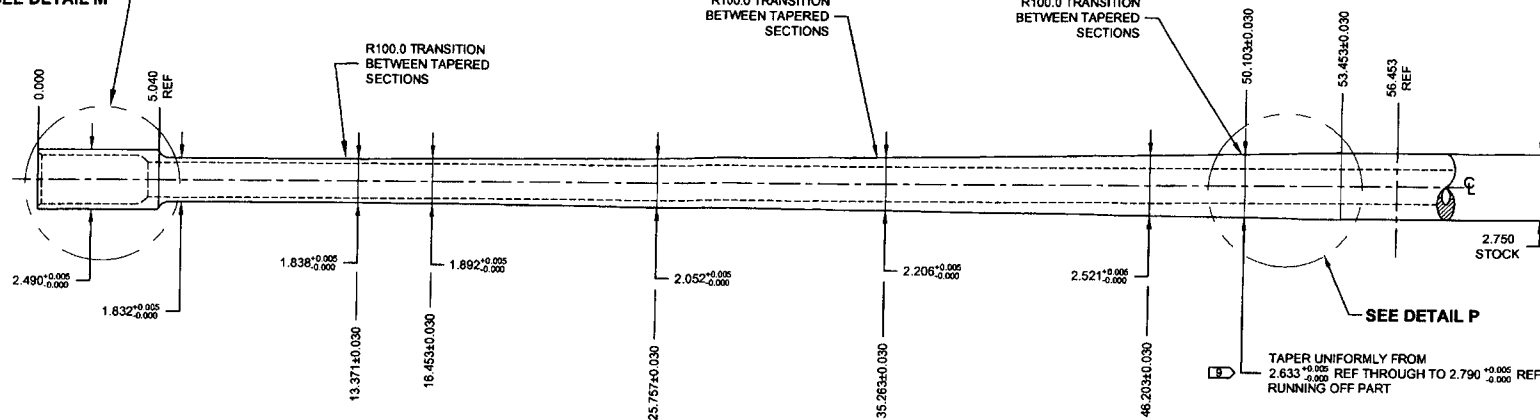
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2

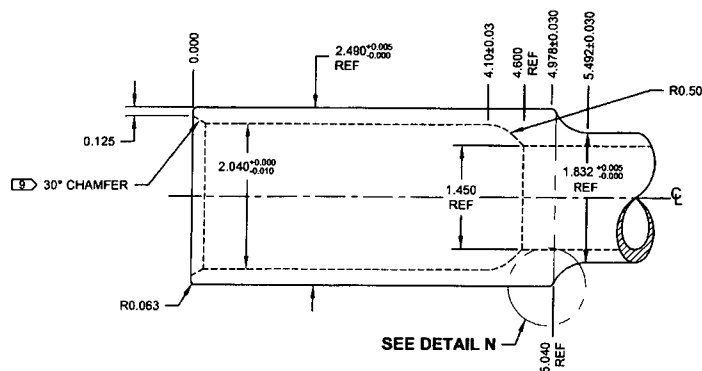
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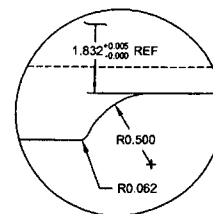
SEE DETAIL M



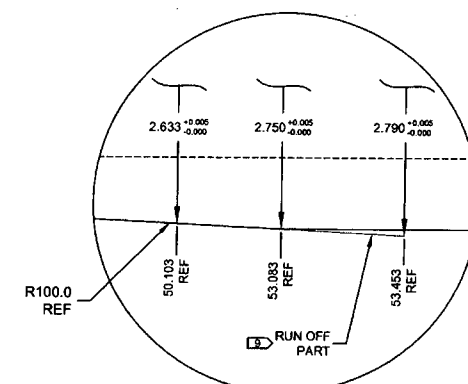
D407-667-245 MACHINING DETAIL



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

RELEASED

2015 APR 09

DESIGN	47	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	47	DRAWING NO.	REV. G
MFG. APPR.	47	D407-667-245	SHEET 4 OF 4
APPROVED	47	TITLE	SCALE
DE APPR.	47	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	15.03.20	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
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June 17th 08

Batch:

D206-667-203 Folio

2.5 Rollers w/1.6" shim underneath X 3

3.125" Shim in buggy A

All programs run with long end of tube on **large table**.

Tube should be marked @

19.375" from cuff

37" RED from cuff

then centerline 52.4375" ish...

First Step - Approach Y @ 3290 and 1500 on W.

Run programs 206a 1-2-3-4 from **37 line**.

Program 4 stops at 19.375 line. Program 10 will start at that line, then all other programs return to that spot. Run 10-14 without stopping, Flip, Then Repeat same operations for second side. Then check.

Second step - Approach Y @ 3340 & 3440 on W

Run program 15 - 25 as needed.

NOTES:

October 14, 2010 - ran 19, 19c,e, then 20 to get 41.98 @ 23.6 for height. Tube was even. another tube finished at program 25.

Jan 7-11 Ran 2 tubes, tubes were to high. Changed tangent line from 19.5 to 19.375 check next time around. Both tubes were still ok. tubes finished with program 15.

june 6-11 Ran program 15, 15a, 15b and 19 (checked each time program was run on both side) with tangent line change at 37 and tangent line 19.375, with the changes tube was ok. 1/2 span was 41.937 and 41.960. height was 23.625 on both sides. and angles of 54.4 and 54.6

sept 28/11 after prog 14 we were 1" away. ran 15, skipped 15 a and b, ran 19. still 3/4" away 15 a and b are obsolete. jw

13-02-27 program 19d under revision, one line backs up by 45 points for no apparent reason.

Passes:

1
2
3
4
10
11
12
13
14
15
16
19A
19B
19C
19

1
2
3
4
10
11
12
13
14
15
19
19A
19B
19C
19



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO29199**

Purchase Order Date 7/20/2015

PO Print Date 7/21/2015

Page Number 3 of 4

Order From :

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Linda Lacelle

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

6	132095	D206-667-203RLC CROSSTUBE	7/21/2015	1.00	\$160.00	\$160.00
---	--------	------------------------------	-----------	------	----------	----------

No
7/21/2015

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$160.00

7	132263	D407-667-205 CROSSTUBE	7/21/2015	1.00	\$160.00	\$160.00
---	--------	---------------------------	-----------	------	----------	----------

No
7/21/2015

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$160.00

SP15-07-21

Note:

7/21/2015



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO25286	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 29199
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 7 CROSSTUBES

ITEM ID: D407-667-205 AFT CROSSTUBE - HIGH 407

- 1 - WORK ORDER ID#: 132263
- 2 - WORK ORDER ID#: 132262
- 3 - WORK ORDER ID#: 130380
- 4 - WORK ORDER ID#: 130379

ITEM ID: D206-667-203RLC AFT CROSSTUBE - HIGH 206L / L1 / L3 / L4

- 5 - WORK ORDER ID#: 132094
- 6 - WORK ORDER ID#: 134207
- 7 - WORK ORDER ID#: 132095

Action Taken:						Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-7) AS PER ASTM1417M-13						20 July 2015	DOT-APP 61 53-89
NO CRACK FOUND							
Pen: ZL-27A MWO5678 DEV: SKD-S2 MPO11715 CLEANER: SKC-S MPO13923							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:		ACA/SCA Stamp	Date:
Name:	ANTONINO MARCHETTA	DOT-APP 61 53-89	20 July, 15

5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	Qty -101	Qty -201	Qty -103	Qty -203	Qty -105	Qty -205	Part Number	Description
	X						D206-667-101	CROSSTUBE INSTALLATION, 206A/B HIGH FWD
		X					D206-667-201	CROSSTUBE INSTALLATION, 206A/B HIGH AFT
			X				D206-667-103	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 HIGH FWD
				X			D206-667-203	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 HIGH AFT
					X		D407-667-105	CROSSTUBE INSTALLATION, 407 HIGH FWD
						X	D407-667-205	CROSSTUBE INSTALLATION, 407 HIGH AFT
1	1						D206-667-141	CROSSTUBE ASSEMBLY, 206A/B HIGH FWD
2		1					D206-667-241	CROSSTUBE ASSEMBLY, 206A/B HIGH AFT
3			1				D206-667-143	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 HIGH FWD
4				1			D206-667-243	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 HIGH AFT
5					1		D407-667-145	CROSSTUBE ASSEMBLY, 407 HIGH FWD
6						1	D407-667-245	CROSSTUBE ASSEMBLY, 407 HIGH AFT
10	*2	*2	*2		*2		D2891-1	SUPPORT
11				*2			D2892-1	SUPPORT
12						*1	D2894-1	SUPPORT
13	*4	*4	*4		*4		D3595-063-395	RUBBER CUSHION
14				*4			D3595-063-450	RUBBER CUSHION
15						*2	D3595-075-430	RUBBER CUSHION
16	*4	*4	*4		*4		MS21920-20	CLAMP
17				*4		*4	MS21920-22	CLAMP
18						*2	MS21920-25	CLAMP (OR MS21920-24)
19	4	4	4		4		AN5-32A	BOLT
20				4		4	AN5-34A	BOLT
21	4	4	4	4	4	4	MS21042L5	NUT (OR MS21042-5)
22	8	8	8	8	8	8	NAS1149C0563J	WASHER (OR AN960JD516)
23						*2	D3190-1	CHAFING SHIELD
40	*2		*2	*2	*2	*2	D2873-043	NUT PLATE
41	*2		*2	*2	*2	*2	D2873-045	NUT PLATE
42		2					D2872-043	NUT PLATE
43		2					D2872-045	NUT PLATE
44	10		10				AN5-7A	BOLT
45		10		10	10	10	AN5-10A	BOLT
46	4	10	4		4		AN5-30A	BOLT
47				4		4	AN5-32A	BOLT
48			12				AN970-4	WASHER (OPTIONAL)
49		6					MS21042L5	NUT (OR MS21042-5)
50	10	12	10	10	10	10	NAS1149C0563J	WASHER (OR AN960JD516)
60		1					D3039-3	CENTER DRILL (TOOLING, NOT INSTALLED)

*REFERENCE ONLY. PARTS ARE INCLUDED IN D206-667-141/-143/-241/-243 & D407-667-145/-245
ASSEMBLIES ABOVE

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Revision: D
Date: 11.05.01

Tuesday, May 05, 2015 10:03:15 AM

Page 1

Accept

Setup Start *NS1*

Stop *NS2*

Start Date: 5/5/2015 **Start Qty:** 1.00 ***1***

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: MLJ Date: MAY 05 2015 Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

[illegible]

Draw Nbr	Revision Nbr
-----------------	---------------------

D407-667-245

G

100

Document Control

0.00

~~DAS~~
27
9-83

100

DOCUMENT CONTROL

DC

Memo

0.00

Doc.Control -USB or Paperwork

Photocopy bluefile and create labels as per PPP D407-667-205 CHG009

110

Pick Kit

0.00

110

Packaging

Packaging

Memo

0.00

Packaging

120

BENDING MACHINE - CROSSTUBES

0.00

120

Memo

0.00

CNC Bend 1

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and
Folio 21